The Vegetation of Yanagi Islet, Truk, Caroline Islands

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YANAGI ISLET, located midway between Moen and Dublon in Truk lagoon (7° 24′ N.; 151° 53′ E.) is a small islet roughly 30 ft. high, about 800 ft. long and 300 ft. wide, with scarcely any strand but with volcanic rock pavement on all shores, and on the south side, numerous loose volcanic boulders. Much of the volcanic rock of which the islet is formed appears to be a breccia resembling conglomerate. The reef surrounding the islet is rather large, with small storm-deposited rocks on the northeast sides. There is a smallboat pass on the west side and another pass, probably safe for small craft, on the north side. During World War II, the Japanese tunnelled through the islet from a cave on the south side to the north side; another Japanese cave on the south side does not run all the way through the islet. A small-gauge railroad ran from the tunnel into the lagoon, for loading operations. The track is now rusty and twisted.

The vegetation, despite the obvious prior use of the islet for military purposes, is relatively undisturbed in a few small areas. The Trukese do not live on the islet, but visit it occasionally for fish and shell-fish, and perhaps for mangoes. There are only a few coconut palms and a few of their seedlings.

The vegetational zonation of the islet appears to comprise three areas: (1) a fringe area, more or less encircling the islet at sea level. (2) An open, rock-strewn extremity on the east, with a herbaceous cover, which slopes toward the east and terminates abruptly as a low cliff. This area is similar to the Tunnuk-Penniasene and Mechitiu lava flows, but here there is no polygonal-patterned basalt. (3) An inner upland, with a developed tree-cover and fairly good soil. There is in fact a transitional area of low-crowned shrubs between zones 2 and 3; it is not known whether this is a natural attenuation in plant size, accompanied by increasing dominance of the herbaceous cover, which has persisted, or whether it is a result of human disturbance. However, the area contains a U. S. Navy Survey bench-mark on a concrete base (without further information).

The most interesting features of the islet are the complete absence of coralline rock and soil, and the absence of most of the halophytic species of littoral plants which are so common elsewhere in Truk, a lack which is no doubt correlated with the nature of the substrate. The plants of Yanagi are by no means unique, and may be commonly found in Truk, and indeed through much of Micronesia. They are not restricted to volcanic soils, for some of them, at least, are known from the atolls nearby as well. But the strand species such as *Scaevola Taccada, Messerschmidia argentea, Terminalia samoensis,* and *Soulamea amara* are notably absent. Most of the species which occur on Yanagi also occur on the reef islets of Truk in coralline soil; but the lack of these littoral plants, which might reasonably be expected to grow there, is the curious and interesting feature of Yanagi Islet.

VEGETATION ZONES: Since the islet is so small, altitudinal considerations are of no account above sea level. The fringe area (1) seems to differ from the inner upland area (3) chiefly because of the exposure of the former and its hindrances to undisturbed plant growth, partly because of subjection to change from wind and waves, and to the concomitant salt spray, and partly because of the abundant volcanic boulders but thin, scanty soil. The grassland (2) and the intermediate area of shrubs may be the result of disturbance, or, again, may be the result of hard, thin soil with numerous embedded rocks, combined with exposure to wind and illumination. Salt spray is apparently minimized by the

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reef, which lies many feet from the islet's shore. No rainfall records are available; however, the inner forest with its better development of soil- and tree-cover no doubt accumulates moisture and retains it longer than the grassland and fringe area, with their porous volcanic boulders.

1, Fringe Area. A, Upper story: **Desmodium umbellatum* (L.) DC., common, the trunk to 10 cm. diameter; **Colubrina asiatica* (L.) Brongn., common, shrubby; **Clerodendron inerme* (L.) Gaertn., common scandent shrub; **Callicarpa candicans* (Burm.) Hochr., scattered; **Barringtonia asiatica* (L.) Kurz, scarce, only small plants seen; **Guettarda speciosa* L., only on south side; **Allophylus timorensis* (DC.) Bl., on south side; **Ficus* sp., on south side; **Premna obtusifolia* R. Br., on south side only; **Wedelia biflora* (L.) DC. ex Wight, scandent shrub; **Morinda citrifolia* L.—B, Vines: *Abrus precatorius* L.; **Ipomoea digitata* L.; **Passiflora foetida* L.; *Dioscorea* sp.; **Ipomoea pes-caprae* L., only one plant seen, in a small area; **Derris elliptica* (Roxb.) Bentham.—C, Ground cover: **Microsorum scolopendria* (Burm.) Copel.; *Vernonia cinerea* (L.) Less.; *Echinochloa colonum* (L.) Link; **Tacca leontopetaloides* (L.) Ktze., scattered and rare; **Digitaria pruriens* (*Trin.*) Büse.—D. Epiphytes: **Asplenium* sp.; **Davallia solida* (Forst.) Sw.; **Dendrobium* sp.

2, Grassland. A, Herbaceous cover, extreme eastern end of islet: **Digitaria pruriens* (Trin.) Büse; *Paspalum dilatatum* (?); *Chrysopogon aciculatus* (Retz.) Trin.; *Paspalum conjugatum* Berg.; *Cyperus* sp.; **Fimbristylis atollensis* St. John; *Emilia sonchifolia* DC.; *Phyllanthus amarus* Schum. & Thonn.; **Portulaca samoensis* v. Poelln.; **Microsorum scolopendria* (Burm.) Copel., a dwarf form.—B, Transitional zone, with shrubs; merging with 3: *Desmodium* sp. (seedlings); *Hedychium coronarium* Koen. & Retz.; **Barringtonia asiatica* (L.) Kurz, one seedling; **Tacca leontopetaloides* (L.) Ktze.; *Abrus precatorius* L.; **Premna obtusifolia* R. Br.; **Passiflora foetida* L.; *Abelmoschus* sp.; *Capsicum frutescens* L.; *Cocos nucifera* L.(a few young trees); **Morinda citrifolia* L.; **Colubrina asiatica* (L.) Brongn.; **Canavalia microcarpa* (DC.) Piper.

* Species marked with an asterisk are indigenous.

3, Inner Upland Forest Area.—A, Trees: *Mangifera indica* L.; *Musa balbisiana* X *acuminata; Carica Papaya* L.; **? Terminalia catappa* L.; **Ficus tinctoria* Forst.; *Erythrina variegata* L.; *Cocos nucifera* L.—B, Shrubs: **Colubrina asiatica* (L.) Brongn.; **Morinda citrifolia* L.; **Glochidion ramiflorum* Forst.; **Polyscias grandifolia* Volkens.—C, Ground cover: **Oplismenus compositus* (L.) Beauv.; *Paspalum conjugatum* Berg.; *P. dilatatum* (?).—D, Vines: **Canavalia microcarpa* (DC.) Piper; *Abrus precatorius* L.; **Piper fragile* Benth.—E, Epiphytes: **Davallia solida* (Forst.) Sw.; **Microsorum scolopendria* (Burm.) Copel.

All plants mentioned are represented by specimens in possession of the senior author.

ANIMALS PRESENT: The terrestrial animals, excluding insects and other invertebrates, were noted and identified by William R. Newman. Two species of lizard were fairly common, *Emoya cyanura* and *E. boetgeri.* The birds noted were *Aplonis opacus angus,* the Micronesian starling; *Demigretta sacra sacra,* the reef heron (dark phase); *Myzomela cardinalis major,* the cardinal honey-eater; *Collocalis inquieta rukensis,* the Carolines swiftlet; and *Gygis alba,* the fairy tern.

SUMMARY

The small volcanic islet in Truk Lagoon called Yanagi is remarkable for the lack of coralline development and the lack of halophytic vegetation which are common elsewhere on Truk. The vegetation appears to comprise three zones, which are called the fringe area, the grassland area, and the upper inland forest. The summit is about 30 ft. above sea level, and the islet is surrounded by a reef. Though occupied during the war, the vegetation is now fairly recovered from disturbance. A list of the plants occurring in each vegetation zone, and a brief note on some animals observed, is given.

REFERENCE

MAYR, E. 1945. Birds of the South-West Pacific. Macmillan, N.Y.